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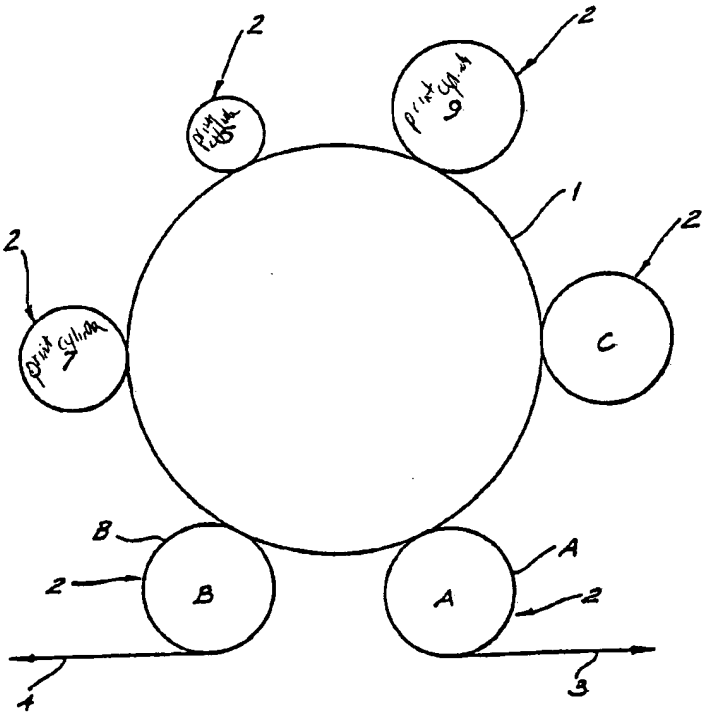
(54) Title: APPARATUS FOR PRINTING QUASI RANDOM NUMBER TABLES

(57) Abstract

An apparatus for printing quasi random number tables (as herein defined) comprising a flexographic printing press having at least two printing cylinders (9, 5, 7) with at least two of said cylinders (9, 5, 7) in the form of table printing cylinders having different circumferences, the circumference of each cylinder being a multiple of a basic pitch value, each table printing cylinder (9, 5, 7) being arranged to print one or more rows or columns of numbers printed by the other table printing cylinders. Preferably the circumference of each cylinder is determined by the basic pitch value multiplied by a prime number. In one form of the invention the said table printing cylinders (9, 5, 7) include a pair of table printing cylinders (9, 5, 7) having different circumferences, each one of the pair of table printing cylinders (9, 5, 7) being arranged to print a plurality of rows of numbers, the numbers in each row being spaced from the other of the pair of table priting cylinders.



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APPARATUS FOR PRINTING QUASI RANDOM NUMBER TABLES

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

This invention relates to apparatus for printing quasi random number tables and has been devised particularly though not solely for printing tables for games of chance.

2. BACKGROUND ART

It is well known to provide tables of apparently random numbers for use in playing games of chance, such as bingo or various other games requiring the selection of a number of "winning numbers" from a table of such numbers. Further adaptations of these games require a winning combination incorporating, for example, three numbers the same in a row or three "prizes" of the same value alongside three numbers drawn from a selection of such numbers and announced or otherwise published.

In fact these tables are seldom true random number tables but incorporate a very large number of variables which are eventually repeated after a large number of tables have been printed. To the end user, however, each table appears to incorporate a matrix of apparently random numbers and is referred to throughout this specification as a "quasi random number table".

It is also been known to use such tables in which "prizes" are covered by a silvered layer rendering the prize values invisible until the silver layer is scratched off. Such games are commonly called "scratch bingo games". It has been a disadvantage in the past that the cards of quasi random number tables incorporating silvered coatings used in scratch bingo games have been time consuming and difficult to print, requiring a number of printing runs and considerable handling and collating.

Advantageous methods of printing quasi random number tables have been described in U.S. Patent Nos. 4,541,333 and 4,601,239 to the present patentee. It is desired

to also provide a method of printing quasi random number tables in a matrix configuration for broader application of the process.

It is therefore an object of the present invention to provide apparatus for printing quasi random number tables which will obviate or minimize the foregoing disadvantages in a simple yet effective manner, or which will at least provide the public with a useful choice.

SUMMARY OF THE PRESENT INVENTION

Accordingly the invention consists in apparatus for printing quasi random number tables (as herein defined) comprising a flexographic printing press having at least two printing cylinders, characterized by the provision of at least two of said cylinders in the form of table printing cylinders having different circumferences, the circumference of each cylinder being a multiple of a basic pitch value, each table printing cylinder being arranged to print one or more rows or columns of numbers printed by the other table printed cylinders. Preferably the circumference of each cylinder is determined by the basic pitch value multiplied by a prime number.

In one form of the invention the said table printing cylinders include a pair of table printing cylinders having different circumferences, each one of the pair of table printing cylinders being arranged to print a plurality of rows of numbers, the numbers in each row being spaced from the other of the pair of table printing cylinders.

In an alternative form of the invention each one of the table printing cylinders is arranged to print at least one column of numbers incorporating a predetermined number of numbers therein different from the number of numbers printed in a column by another of the said cylinders, the columns of numbers being arranged alongside one another in a predetermined matrix. Preferably one or more background printing cylinders are provided, arranged to print background frameworks and/or supporting artwork in conjunction with quasi random number tables. Preferably the flexographic press is provided with a further roller adapted to print a removable coating over numbers printed by the table printing cylinders.

In one form of the invention the flexographic printing press has a central drum and the printing cylinders are arrayed about the drum. In alternative forms of the invention the printing press comprises either a narrow web or a stack-type printing press wherein the printing cylinders are located at separate stations.

Another embodiment of the present invention is directed to apparatus for printing quasi random number tables as part of a flexographic printing press having a plurality of cylinders and cylinder configurations. Each station consists of a flexographic printing cylinder with an associated anilox roller and ink fountain. Optional ink dryers may also be included with each station. In the present invention, each of a plurality of stations includes an endless flexographic printing belt belted in a registered position on each of the printing stations. The belt at each station is of different length which is a multiple of a basic pitch value. The length of the belts are selected so that if the belts are in a first relationship to one another at a first point and time, it will take a large number of rotations of each belt before this relationship is repeated.

In this embodiment of the present invention, each belt is placed between segments of flexographic printing plates, allowing changing pseudo-random number tables to be printed side by side with a constantly printed image. The present invention has particular application to presses used to print inserts for newspapers, coupons, catalogs, etc., for example, comic inserts.

Notwithstanding any other forms that may fall within its scope, the present invention will now be described by way of example only with reference to the accompanying drawings, in which:-

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a diagrammatic end view of a flexographic printing press incorporating printing cylinders arranged according to the invention.

Fig. 2 is an example of a quasi random number table adapted to be printed by the apparatus shown in Fig. 1;

Fig. 3 is a diagrammatic view of the printing layout from three table printing cylinders;

Fig. 4 is a diagrammatic layout showing the numbers printed by cylinder number 5 emphasized;

Fig. 5 is a diagrammatic layout similar to Fig. 4 with the numbers printed by cylinder number 9 emphasized.

Fig. 6 is a diagrammatic end view of a flexographic printing press incorporating printing cylinders arranged according to an alternative form of the invention;

Fig. 7 is an example of a quasi random number table adapted to be printed by the apparatus shown in Fig. 6;

Fig. 8 is a diagrammatic view of a narrow web flexographic press incorporating printing cylinders arranged according to the invention; and

Fig. 9 is a diagrammatic view of a stack-type flexographic printing press incorporating printing cylinders arranged according to the invention.

Figure 10 is a diagrammatic view of an alternate embodiment of the present invention as part of a flexographic newspaper press.

Figure 11 is a view of the endless belt idle roller assembly of the embodiment of Figure 10.

Figure 11 illustrates an example of a web printed using the embodiment of Figure 10.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

A method and apparatus for printing quasi random number tables is described. In the following description, numerous specific details, such as pitch multiple, number of stations, etc. are set forth in order to provide a more thorough description of the present invention. It will be obvious, however, to one skilled in the art, that the present invention may be practiced without these specific details. In other instances, well known features have not been described in detail in order not to unnecessarily obscure the present invention.

The present invention employs belts or cylinders to implement a quasi random number printing scheme. Each belt and cylinder includes printing plates having numbers or symbols formed thereon. The plates are disposed in rows and placed at a fixed pitch with respect to each other. When belts are utilized, a plurality of belts, each having a length which is a different multiple of the basic pitch value, are employed at one or more printing stations. If cylinders are employed, each of a plurality of cylinders has a circumference which is a multiple of the basic pitch value. The belts and cylinders are moved in registration so that a large number of revolutions is required before a specific orientation is repeated.

In the preferred form of the invention a flexographic printing press, for example a Victory Kidder Central Impression Press, is set up to print a series of quasi random number tables as follows. Referring to Figure 1, the press comprises a central drum 1 around which is arrayed a plurality of printing cylinders 2 in the manner well known for use in, for example, a six-color press. Each cylinder has a circumference determined by the role that it plays in printing the quasi random number tables, each circumference being a multiple of a basic pitch value. For convenience the cylinders are hereinafter referred to by reference numbers corresponding to the basic pitch value multiple which determines their circumference. It is preferred that the circumference of each cylinder is equal to the basic pitch value multiplied by a prime number as this gives the greatest

number of variations before the printing pattern is repeated. The material, for example card, paper or plastic film packaging material, which is to be printed in the press is fed in as shown at 3 whereupon it wraps around the first cylinder A onto the drum 1, finally exiting by wrapping around the cylinder B and feeding off as shown at 4.

The first cylinder A is typically used to print a base color for use under the scratch silver, and the second cylinder C may also be used for the printing of another base color. The numbers in the quasi random number tables are printed by the table printing cylinders 9, 5 and 7 in a format as will be described further below. The final cylinder B is used to apply the scratch silver material over the numbers printed by the cylinders 9, 5 and 7.

The table printing cylinders 9, 5 and 7 are each of a different circumference which in each case is a multiple of a basic pitch value. For example cylinder 7 has a circumference of seven times the basic pitch value and is arranged to print a column of seven numbers arrayed around the circumference around the cylinder. It will be noted that the cylinders 5 and 7 have circumferences which are multiples of prime numbers (five and seven respectively) of the basic pitch value. The cylinder 9 has a circumference which is a multiple of three as this gives a convenient size but a greater number of different repetitions could be obtained by giving this third cylinder a circumference which is, for example, eleven times the basic pitch value. One of the cylinders (in this case cylinder 9) may be the same circumference as the circumferences of the background and scratch silver printing cylinders A, B and C.

The flexographic printing press may be set up to print the quasi random number tables by column or by row. In the first form of the invention, printing the tables by column, the cylinders are set up to print quasi random number tables of the type shown in Fig. 2 wherein each sub-rectangle 10 forms part of a matrix of similar rectangles or "numbers". In the case of the table shown in Fig. 2 the matrix is a 6 x 6 matrix. For convenience throughout this specification the contents of each sub-rectangle 10 is

referred to as a "number" although it will be appreciated that the rectangle may contain more than one number and may alternatively contain other devices such as symbols, etc.

The numbers are printed onto the table using the table printing cylinders 9, 5 and 7 so that each cylinder prints every third column across the table. Explanation of this printing will now be made with reference to Figs. 3, 4 and 5 which show the layout for a 9 column table (as distinct from the 6 column table shown in Fig. 2).

Referring now to Fig. 3 and 9 columns are shown broken down into three sub-sets of 3 columns, although in practice the 9 columns may be side-by-side in a continuous array. For convenience each column in each sub-set has been headed with the designations LH, C, or RH which refer to left-hand, center and right-hand respectively. At the foot of each column can be seen a numeral designating the cylinder which is used to print that column. It can be seen that cylinder 9 is used to print the left-hand column of the first matrix, the right-hand column of the second sub-matrix and the center column of the third sub-matrix. As there are 9 rows in each repeat column show in Fig. 3, it will be appreciated that cylinder 9 prints an entire column as shown in Fig. 3 during one rotation of that cylinder. As cylinder 5 has a much lesser circumference than cylinder 9 the columns which are printed by cylinder 5 involve one revolution of that cylinder for each five numbers printed in that respective column. Similarly with cylinder 7.

This may be seen more clearly with reference to Fig. 4 which shows highlighted the numbers (shown as rectangles) which are printed by cylinder 5 during one revolution of that cylinder. The continuing numbers in that particular column or columns are then printed by further rotations of cylinder 5. Similarly the numbers shown printed by cylinder 9 are highlighted in Fig. 5 wherein it can be seen that nine numbers in each column are printed by a single revolution of cylinder 9. As cylinder 9

is the same basic circumference as the background cylinders A, B and C it may also be used to print the game grid and other directions if required.

It can be seen from an examination of Fig. 3, 4 nd 5 that the numbers printed alongside each other are "randomized" by the different number of revolutions o each table printing cylinder for each revolution of the drum 1. To further randomize the tables each cylinder is used to print a different column in each sub-matrix, etc. but a higher degree of randomization is achieved by using cylinder 9 to print different columns in each sub-matrix.

In this manner it is possible to print a large number of quasi random number tables before the basic combination is repeated. The basic combination is, however, repeated at predetermined intervals and may in the examples shown in Figs. 3, 4 and 5, repeat on every 315th game panel in a printing run. In this manner it is possible to arrange the numbers on each cylinder so that a winning combination is printed on every 315th game panel. These "latent winners" may be used to designate minor (low value) prizes so that the originator of the game may activate a winning combination in every 315th game. Major prize winners are normally hand printed and interleaved and collated within the losing or "latent winner" combinations printed by the method described above.

In an alternative form of the invention the quasi random number tables may be printed by rows as will now be described with reference to Figures 6 and 7, once again using a flexographic press shown diagrammatically in Figure 6.

The press comprises a central drum 101 around which is arrayed a plurality of printing cylinders 102 in the manner well know for use in, for example, a six color press. Each cylinder has a circumference determined by the role that it plays in printing the quasi random number tables, each circumference being a multiple of a basic pitch value. For convenience the cylinders are hereinafter referred to by reference numbers

corresponding to 100 plus the basic pitch value multiple which determines their circumference.

The cylinders comprise two background printing cylinders 110, each having a circumference of 10x the basic pitch value, which is typically 600 mm when used on a Victory Kidder machine. The background printing cylinders are used to print material such as frameworks 104 or artwork 105 in the attractive presentation of the series of tables. The background printing cylinders may also be used to print explanatory material onto the 600 mm x 390 mm preprint used for the printing of the tables.

The cylinders 102 further incorporate a first pair of table printing cylinders 108 and 112. Cylinder 108 has a circumference which is 8x the basic pitch value (480 mm) and cylinder 112 has a circumference which is 12x the basic pitch value (720 mm). The machine is further provided with a second pair of table printing cylinders 106 and 114 having circumferences of 6x the basic pitch value (360 mm) and 14x the basic pitch value (840 mm) respectively.

In use the table printing cylinders are arranged to print quasi random sequences of numbers as follows. The rows of numbers in the table may be conveniently designated rows A to J as shown in Fig. 7. One pair of table printing cylinders are arranged to print alternate rows, e.g. rows A, C, E G and I and the other pair of table printing cylinders are arranged to print interspersed rows B, D, F, H and J.

One cylinder of each pair prints rows of numbers, each number in the row having a space to the next number, the other cylinder in the pair also printing rows of numbers aligned with the rows printed by the first cylinder, each number printed by the second cylinder being interspaced between the numbers printed by the first cylinder.

Although Fig. 7 shows a print-out with the words "CYL. NO 12" etc alongside each prize value, this is for reference only, showing the cylinder which would be used to

print that particular row. Each row will have printed therein three number values, e.g. 12, 16, 4, obtained from a matrix of random numbers from 1 to 99 set up on the relevant cylinder. The object of this particular game is to get three numbers the same alongside a prize in order to win that prize. The game can be varied by using a new control matrix to suit the particular requirements of that game.

The number values in row A (for example) do not appear in any other row. This forms part of the theory behind the game so that in each panel, i.e. rows A-J, a numeral cannot be printed more than once, so avoiding confusion on the part of the player.

A plurality of tables such as that shown in Fig. 7 would normally be printed across the length of a preprint (e.g. 10 tables side-by-side across the 600 mm dimension of a 600 x 390 preprint). In this manner the numbers appear in a different sequence in consecutive tables which are printed side-by-side, giving the appearance of a random number distribution over a large number of tables.

It is a particular feature of this invention that the apparatus enables a series of random number tables to be printed onto newspaper preprints which may be machine processed and wrapped for incorporation with a normal newspaper at the point of printing. This process therefore saves the cost of the separate printing of random number tables onto cards and does away with the additional handling costs necessary for the distribution of those separate random number tables with each newspaper.

It is therefore possible according to the invention to print quasi random number tables particularly suitable for scratch bingo or other lottery type games in a single print run using the apparatus described above and resulting in considerable savings in man handling and time.

Although one preferred form of the invention has been described when applied to a central impression press, it will be appreciated that the invention can equally well

be applied to other types of flexographic press. Such types typically comprise narrow web or stack-type presses. Fig. 8 shows a diagrammatic view of a narrow web press in which the printing press cylinders 20 are located at different locations in the narrow web press and are individually engaged with impression cylinders 21. As for the central impression press previously described with particular reference to Fig. 1, the printing cylinders 20 are each of different size, being multiples of a basic pitch value. By way of example only the cylinders may have the multiples 16, 12, 11 and 13 as shown in Fig. 8. Additional printing stations 22 and 23 may also be provided to add further features to the printed material such as color background and rub-off silver masking.

In a still further form of the invention, as shown in Fig. 9, the invention may be applied to a stack-type press which has a number of printing stations 24 located one above the other in a "stack" as shown. Once again the principle is the same and the table printing cylinders 25 have circumferences which are multiples of a basic pitch value. For example the cylinders may comprise 10, 14, 11 and 13 times multiples as shown in Fig. 9. Additional printing stations 26 may also be provided for additional features such as the printing -on of rub-off silver coating.

An alternate embodiment of the present invention is directed to apparatus for printing quasi random number tables in a matrix as part of a large print area surface and is illustrated in Figures 10-12. One particular application is the printing of such tables as part of a newspaper or newspaper insert.

In the past, it has been difficult to print other than in black and white newsprint on a newspaper without providing a separate dedicated press. It is desired to provide apparatus which allows the printing of additional material or colors as part of or in addition to, a newsprint operation.

Presently, certain presses provide for selective color printing or spot printing for inserts for newspapers. These presses generally are "stack" flexographic printing presses

having a plurality of flexographic printing cylinders. Each flexographic printing cylinder has an associated anilox roller and ink fountain. The various ink fountains can contain ink of different colors and if desired, an ink dryer may be provided at each station. One such stack press is produced by Motter printing press company and is designated the MotterFlex FX-4. However, the Motter press lacks the capability to print quasi random number tables as part of its operation.

In this embodiment of the present invention, one or more flexographic printing stations are provided with an endless flexographic belt having quasi random numbers or symbols formed thereon. The endless belt is disposed about the printing cylinder at each station and disposed adjacent to or between flexographic printing plates on the printing cylinder. Each belt is a different length, with the lengths being multiples of a basic pitch value common to the belts. Each belt has an associated idle roller and an optional tension roller to tension the belt about the printing cylinder.

At a given point and time, the belts at each station will have a particular orientation with respect to one another. Because the belts are different multiples of the basic pitch value, it takes a large number of revolutions of the belts to repeat that particular orientation. For example, if one belt is a length seven times the basic pitch value and a second belt is five times the basic pitch value, when the first belt has made a complete revolution (moving seven gradients), the shorter belt will have made 1.4 revolutions. Thus, it is possible to print a large number of quasi random number tables before the basic combination is repeated and therefore a quasi random relationship may be achieved. As discussed above with respect to the cylinders, the relative multiples of the pitch value determine the number of revolutions of the belts required before a sequence repeats.

Referring to figure 10, the stack press embodiment of the present invention is illustrated. The printing medium or "web" 30 is wound through four printing stations A, B, C, and D. At each station, the web passes between an impression cylinder and a

printing cylinder. Referring to station D, the web passes between impression cylinder 31 and printing cylinder 32. The printing cylinder 32 has disposed on the face thereof of a plurality of flexographic printing plates for printing on a wide web such as a newspaper type web. The printing cylinder 32 is inked by anilox cylinder 35. The anilox roller 35 may be a self contained unit with ink of a desired color provided through an internal nozzle, (not shown). A belt 34 is disposed about printing cylinder 32 and an idler roller 33. If desired, a tension roller, such as tension roller 45 shown at station A, may also be provided to tension the belt 34 about the printing and idle rollers.

In the Motter press, a number of hydraulic "throw-off" mechanisms are provided such as mechanisms 36-39 of station D. The throw-off mechanisms are used to remove the impression cylinder away from the printing cylinder and the anilox roller from the printing cylinder.

The belt 34 is, in the preferred embodiment, is a non-elastic belt having gear teeth or some other suitable means of retaining the belt to insure that the belt is in register with the motion of the printing cylinder. The outer surface of the belt contains a plurality of flexographic printing plates which are adhered to the belt at a predetermined pitch value or gradient. The flexographic plates on the belt 34 are inked by way of the anilox roller 15. Other belts 40-42 are provided at printing stations A-C respectively.

In this embodiment, the length of each belt is equal to the basic pitch value multiplied by a prime number to provide a large number of variations before a printing pattern is repeated. For example, belt 40 in printing station A may have a length seven times the basic pitch value so that seven different plates or rows of plates would be provided on the belt. Similarly, each of the other belts is a multiple of the basic pitch value . Generally, the circumference of the printing cylinder is the same at each station. Thus, the printing plates of the respective belts continuously change in register with one another. In the preferred embodiment, each of the stations prints a number in one

location of a matrix on the web. Thus, the matrix is constantly changing in a quasi random fashion as the printing cylinders rotate.

Figure 11 illustrates a top view of the belt 34 and its operation with the printing cylinder 32. The belt 34 is entwined about printing cylinder 32 and shaft 44. Shaft 44 is coupled to idle roller 33. The belt 34 has a plurality of flexographic plates 45 disposed thereon and each plate can represent one or more numbers or symbols for use in a quasi random table. In one embodiment, the belt has a plurality of teeth on the inside to engage gear teeth on the shaft of the idle roller and/or the printing cylinder. Other suitable methods of positively engaging the belt with the printing cylinder or shaft may be employed as well. In one alternate embodiment, indentations are formed along either side of the belt for engagement with a sprocket or other registered engagement means to propel the belt. Such indentations may take the form of semicircular cut outs along either edge of the belt.

Referring now to Figure 12, an example of a newspaper type web printed using the present invention is illustrated. In this example, the web 30 has a number of print areas defined thereon such as areas 51-57. By positioning the flexographic belts at a desired position, random number tables may be printed at any print area of the web 30. This embodiment has particular application in printing games utilizing quasi random numbers as part of newspaper comics or inserts. For example, if the printing cylinders of the press of Figure 10 are utilized to print in areas 51-56, the belts may be utilized to print quasi random number tables in print area 57. Alternatively, the belts could be arranged to print in one or more of print areas 51-57 as desired.

Additionally, the configuration of the present invention permits the printing of "color on color" by positioning the belts at a desired location. The term "color on color" is not meant to limit the application to color but refers to the ability to print with different belts in the same matrix location. However, by way of example, we refer to the belt at station A as printing red, at station B as printing blue, and at station C as printing

green. The configuration can be used to print one gradient of a single color. Referring to figure 11, print areas 51-54 may be printed red, print areas 55-57 are printed blue and the print areas below that may be printed in green.

Alternatively, because the belts are disposed on the respective printing cylinders to cover the same print area, the colors may be placed anywhere on the page. For example, print areas 53, 54 and 56 are red, print areas 52 and 55 are blue and print areas 51 and 57 are green. This would not be possible in a non-stack press arrangement where the belts must be disposed side by side and so can only print in individual columns. Even though the column locations may be randomized to some extent, there can be no true overlap of print area in such an arrangement.

The embodiment of Figure 10 gives the advantage of allowing larger multiples of the basic pitch value to be employed with the endless belts than with the cylinders. This is due to the fact that the size of the cylinders is a limiting factor, while a belt may be entwined about a plurality of rollers if desired to reduce the amount of space required, thus allowing longer belts. Accordingly, much larger numbers of revolutions will be necessary before a pattern repeats itself.

CLAIMS

1. Apparatus for printing quasi random number tables onto a print surface comprising:

a flexographic press having at least first and second cylinders arrayed about a central drum, said first and second cylinders having first and second circumferences respectively, said first circumference being larger than said second circumference;

said first and second cylinders each having a plurality of printing plates disposed thereon, said plates defining a basic pitch value;

said first and second circumferences each being multiples of said basic pitch value;

said printing surface being disposed about said central drum between said drum and said first and second cylinders;

said first and second cylinders being rotated one pitch value at a time against said printing surface such that an impression of said printing plates is transferred to said printing surface, said first cylinder rotating at a first rate and said second cylinder rotating at a second rate greater than said first rate.

2. The apparatus of claim 1 wherein said first cylinder is a prime multiple of said basic pitch value.

3. The apparatus of claim 1 wherein said second cylinder is a prime multiple of said basic pitch value.

4. The apparatus of claim 1 wherein said first cylinder prints first and second columns of numbers on said print surface spaced apart from one another and said second cylinder prints third and fourth columns of numbers space from one another and interspaced with said first and second columns of numbers.

5. Apparatus for printing quasi random numbers onto a print surface comprising:

a flexographic press having a plurality of printing stations, each of said printing stations having a printing cylinder, an impression cylinder disposed adjacent said printing cylinder, said printing cylinder having a first plurality of flexographic plates disposed thereon, and inking means disposed adjacent said printing cylinder for providing ink to said printing cylinder;

said print surface comprising a web disposed through each printing station such that said web is disposed between said impression cylinder and said printing cylinder;

a flexographic belt disposed about said printing cylinder and an idle roller, said belt having a second plurality of flexographic plates disposed thereon, said plates disposed at a basic pitch value;

each of said plurality of stations having a belt with a length being a multiple of said basic pitch value and each belt being a different length than any other belt;

means for rotating said printing cylinder, impression cylinder and said belt such that images on said first and second plurality of flexographic plates are transferred to said web, said belt at each of said stations having a rate of rotation dependent on its length.

6. The apparatus of claim 5 wherein said inking means comprises an anilox roller.

7. The apparatus of claim 5 wherein said web comprises newspaper.

8. The apparatus of claim 5 wherein said belt at each of said stations is a prime multiple of said basic pitch value.

9. The apparatus of claim 5 wherein said belt includes gear teeth on one side thereof for engagement with corresponding gear teeth on said printing cylinder.

10. The apparatus of claim 5 wherein said plurality of stations comprises four.

11. The apparatus of claim 5 wherein said belt is further disposed about a tension roller.

12. The apparatus of claim 5 wherein said belts are disposed on said printing cylinders so as to cover a common print area to permit color on color printing.

13. Apparatus for printing quasi random numbers onto a print surface comprising:

a flexographic press having a plurality of printing stations, each of said printing stations having a printing cylinder, an impression cylinder disposed adjacent said printing cylinder, said printing cylinder having a first plurality of flexographic plates disposed thereon, and inking means disposed adjacent said printing cylinder for providing ink to said printing cylinder;

said print surface comprising a web disposed through each printing station such that said web is disposed between said impression cylinder and said printing cylinder;

a flexographic belt disposed about said printing cylinder and an idle roller, said belt having a second plurality of flexographic plates disposed thereon, said plates disposed at a basic pitch value;

each of said plurality of stations having a belt with a length being a multiple of said basic pitch value and each belt being a different length than any other belt, said belt disposed at each printing station to print at a common print area;

means for rotating said printing cylinder, impression cylinder and said belt such that images on said first and second plurality of flexographic plates are transferred to said web, said belt at each of said stations having a rate of rotation dependent on its length.

14. The apparatus of claim 13 wherein said inking means comprises an anilox roller.

15. The apparatus of claim 13 wherein said web comprises newspaper.

16. The apparatus of claim 13 wherein said belt at each of said stations is a prime multiple of said basic pitch value.

17. The apparatus of claim 13 wherein said belt includes gear teeth on one side thereof for engagement with corresponding gear teeth on said printing cylinder.

18. The apparatus of claim 13 wherein said plurality of stations comprises four.

19. The apparatus of claim 13 wherein said belt is further disposed about a tension roller.

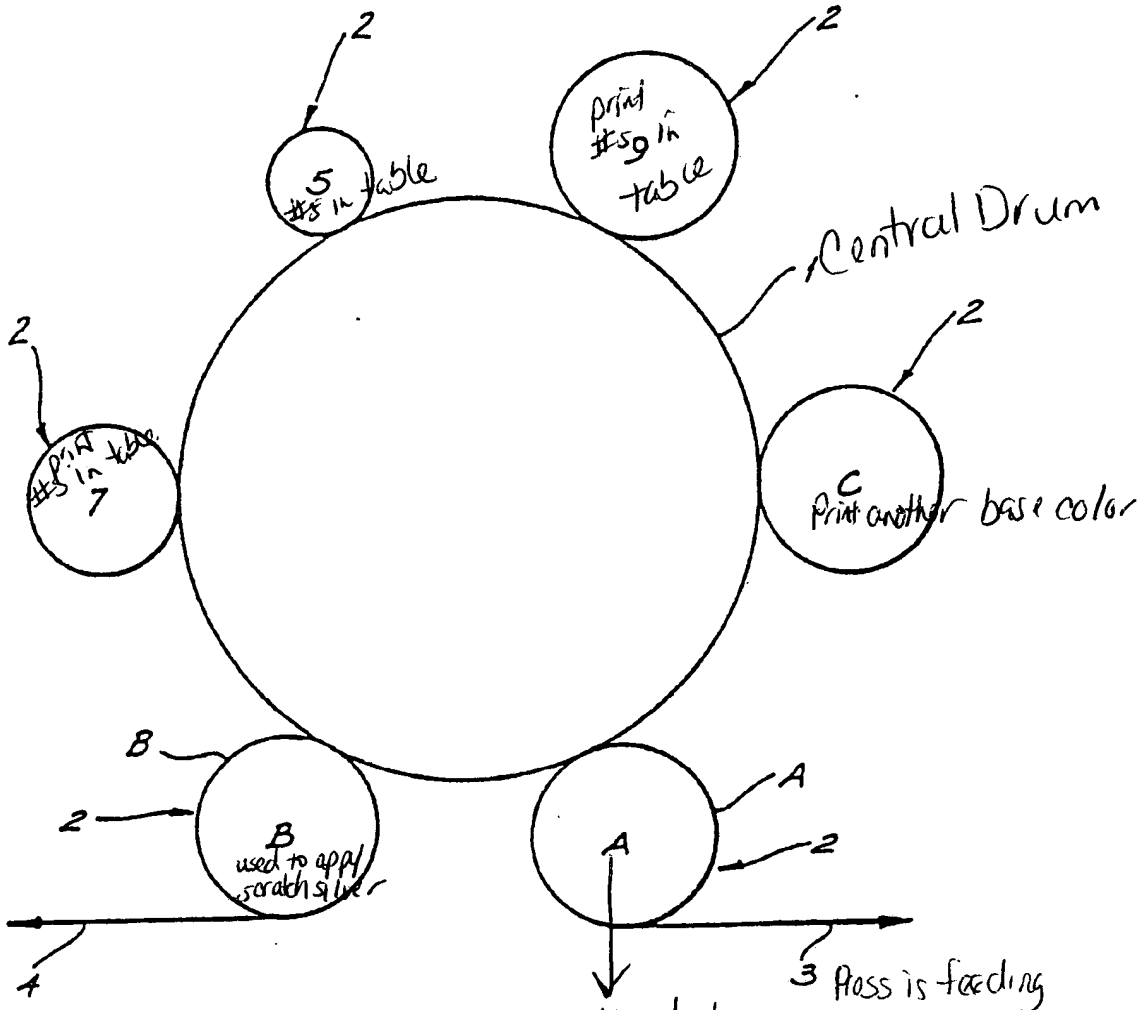

FIG. 1

10

34 $100	25 $500	4 $100	15 $500	11 $200	12 $300
2 $300	3 $400	24 $100	16 $1,000	30 $10,000	13 $400
19 $5,000	18 $3,000	32 $400	23 $400	31 $200	7 $2,000
27 $2,000	21 $200	35 $500	36 $1,000	1 $200	6 $1,000
9 $5,000	20 $10,000	28 $3,000	10 $10,000	17 $2,000	22 $300
26 $1,000	33 $400	5 $500	8 $3,000	14 $100	29 $5,000

10

FIG. 2

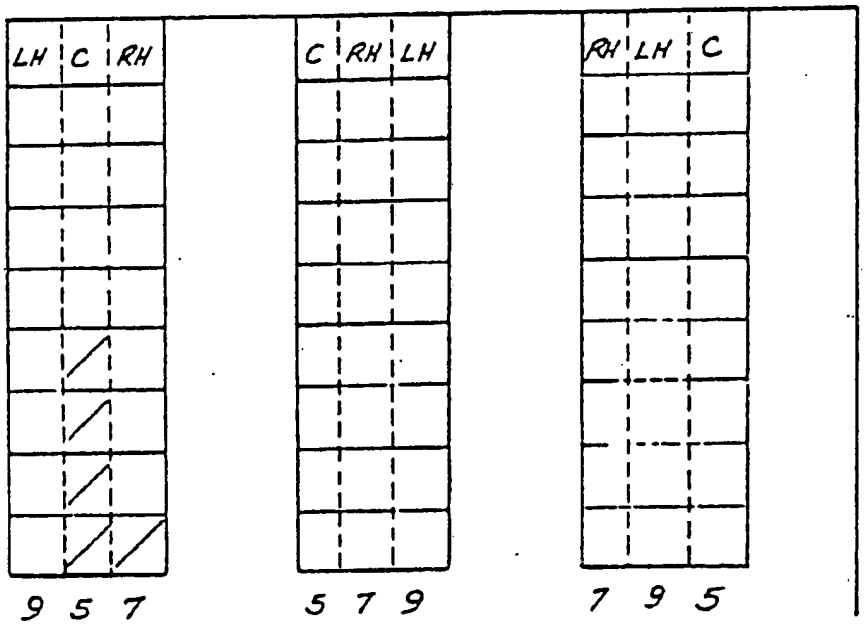

FIG. 3

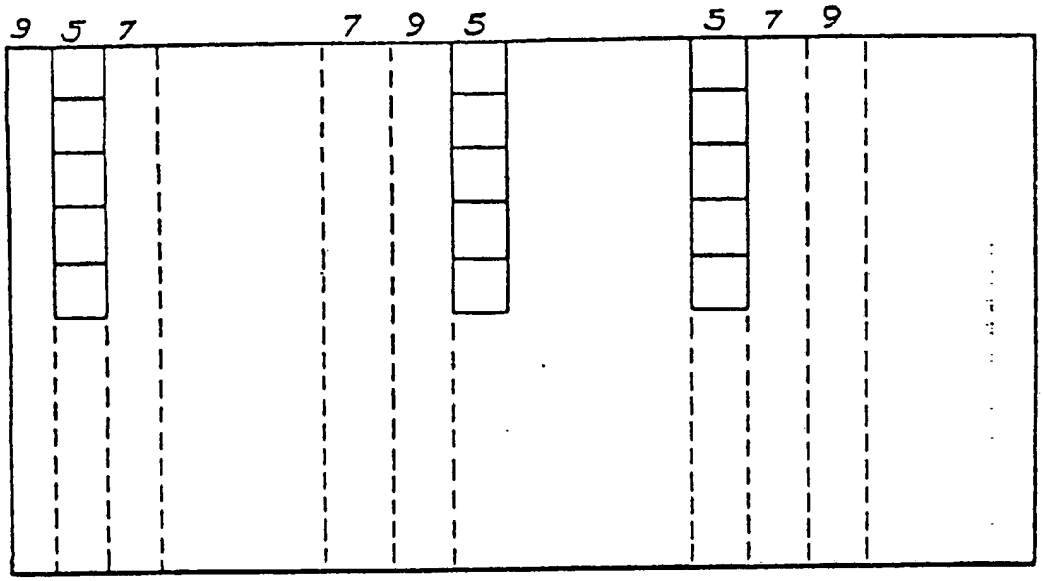

FIG. 4

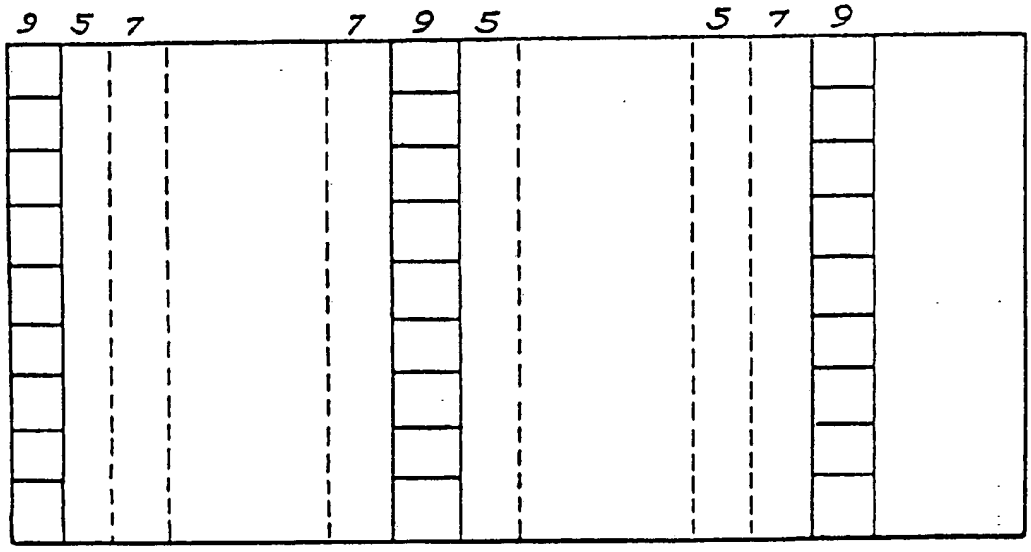

FIG. 5

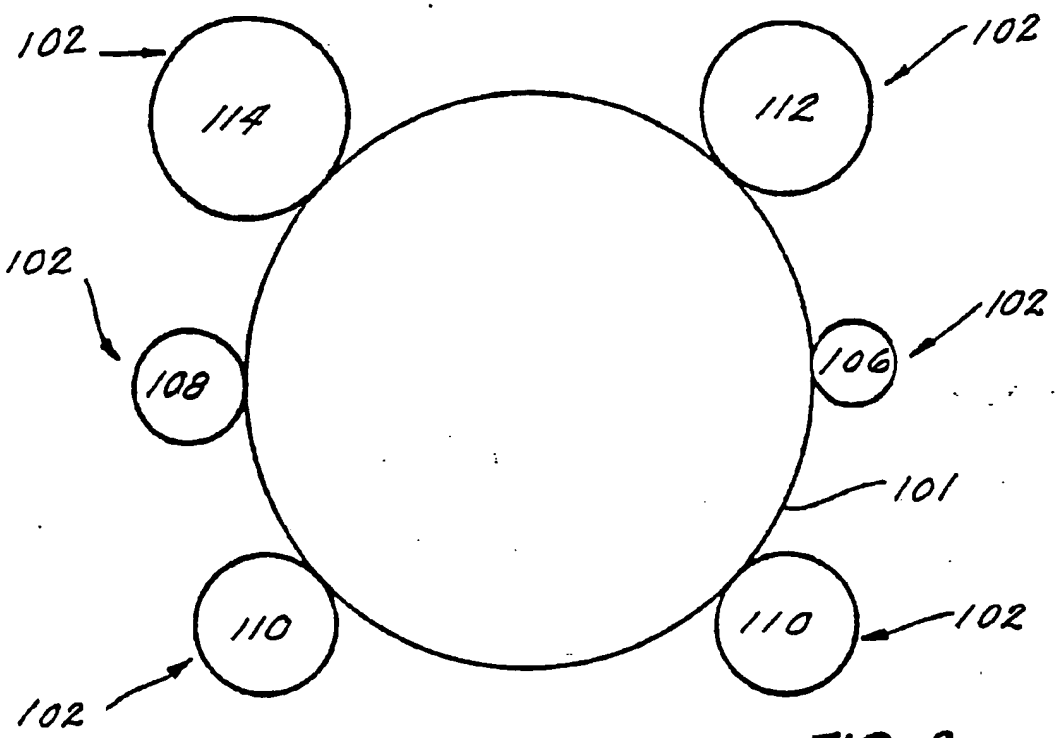

FIG. 6

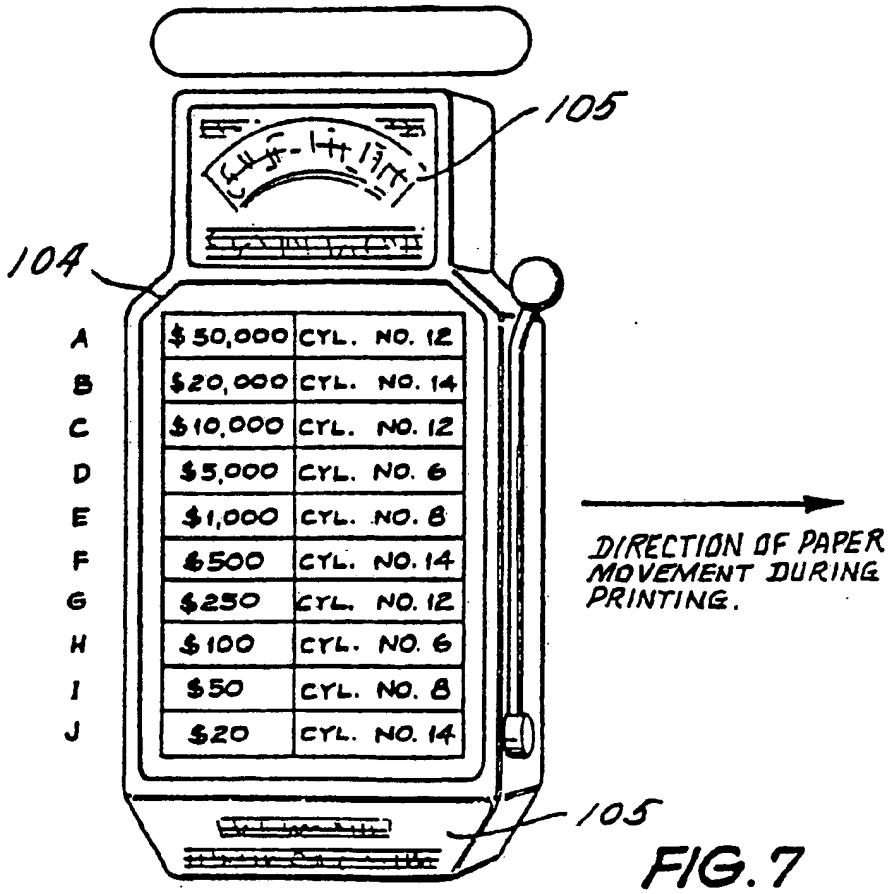

FIG. 7

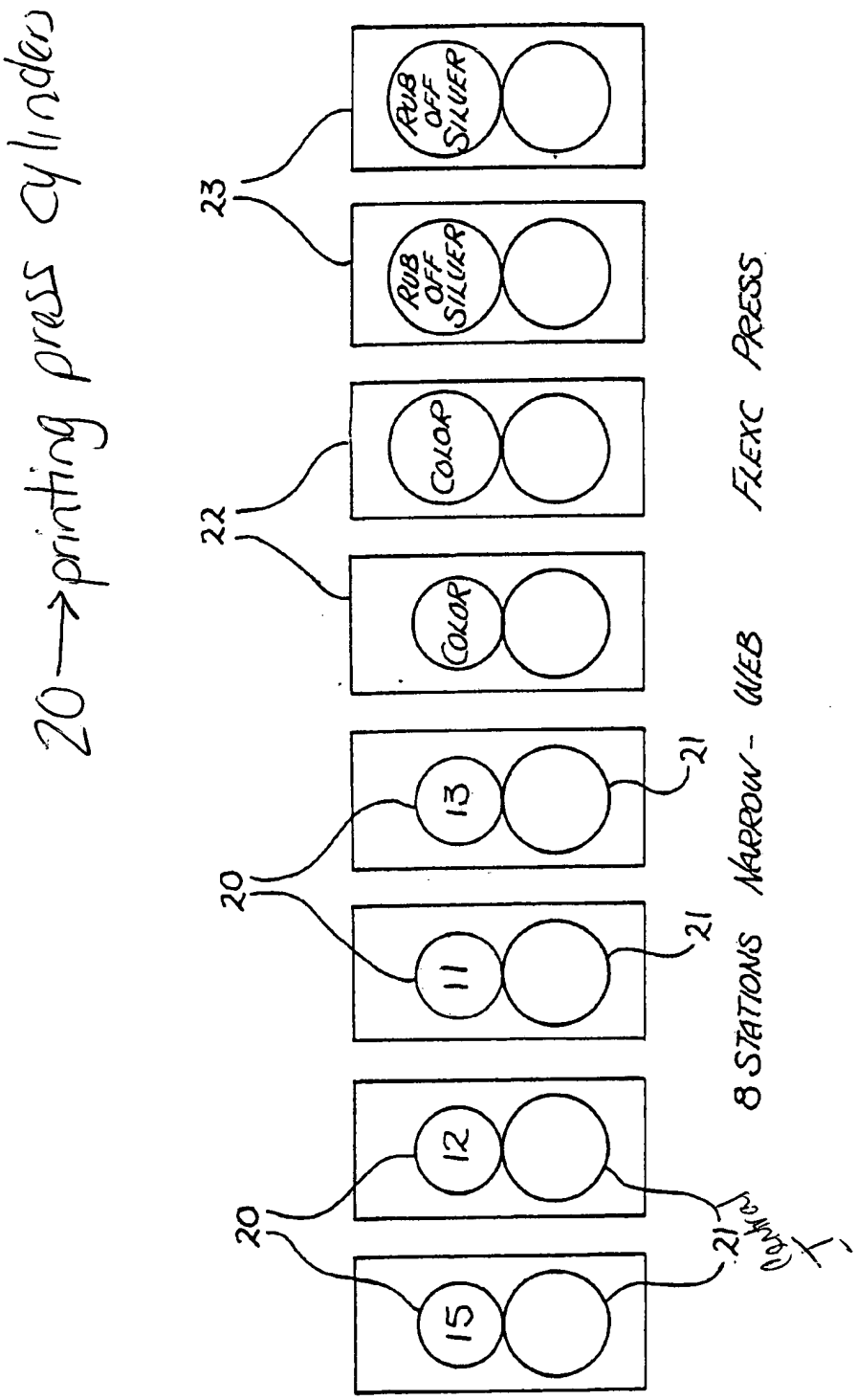

Fig. 8

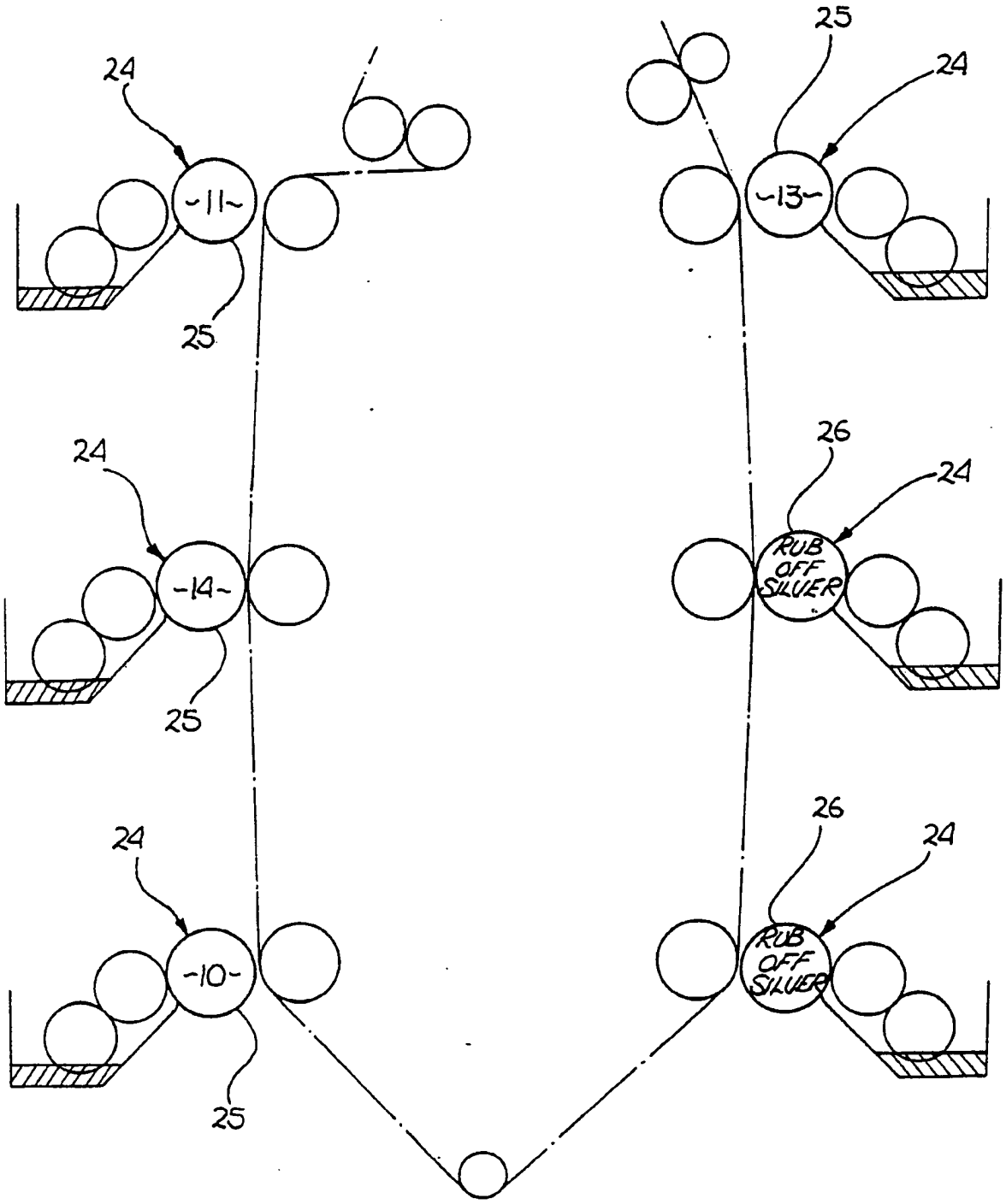
24
-11-
25
25
24
-13-
24
-14-
25
26
24
RUB OFF SILVER
24
-10-
25
26
24
RUB OFF SILVER

Fig. 9

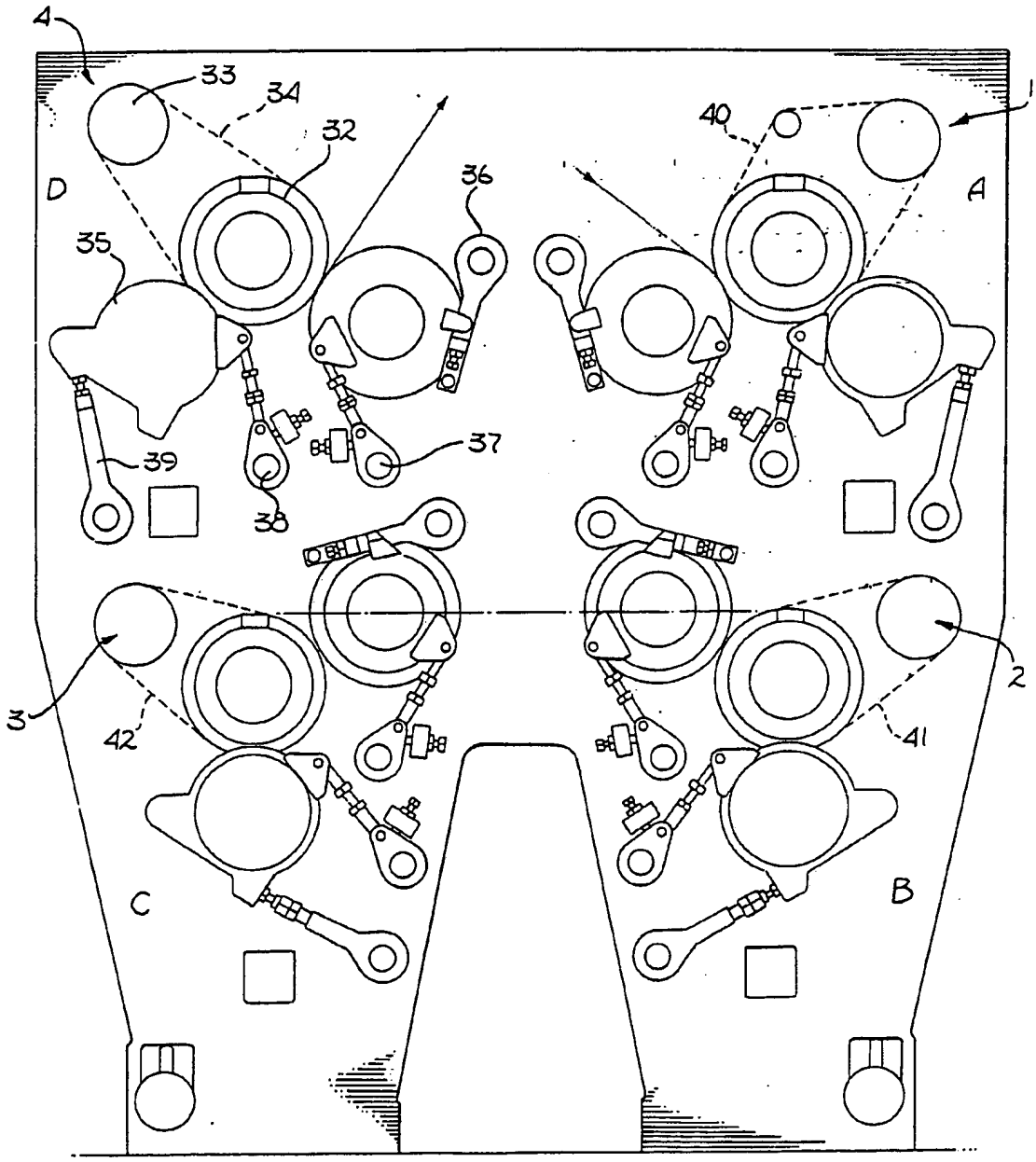

Fig. 10

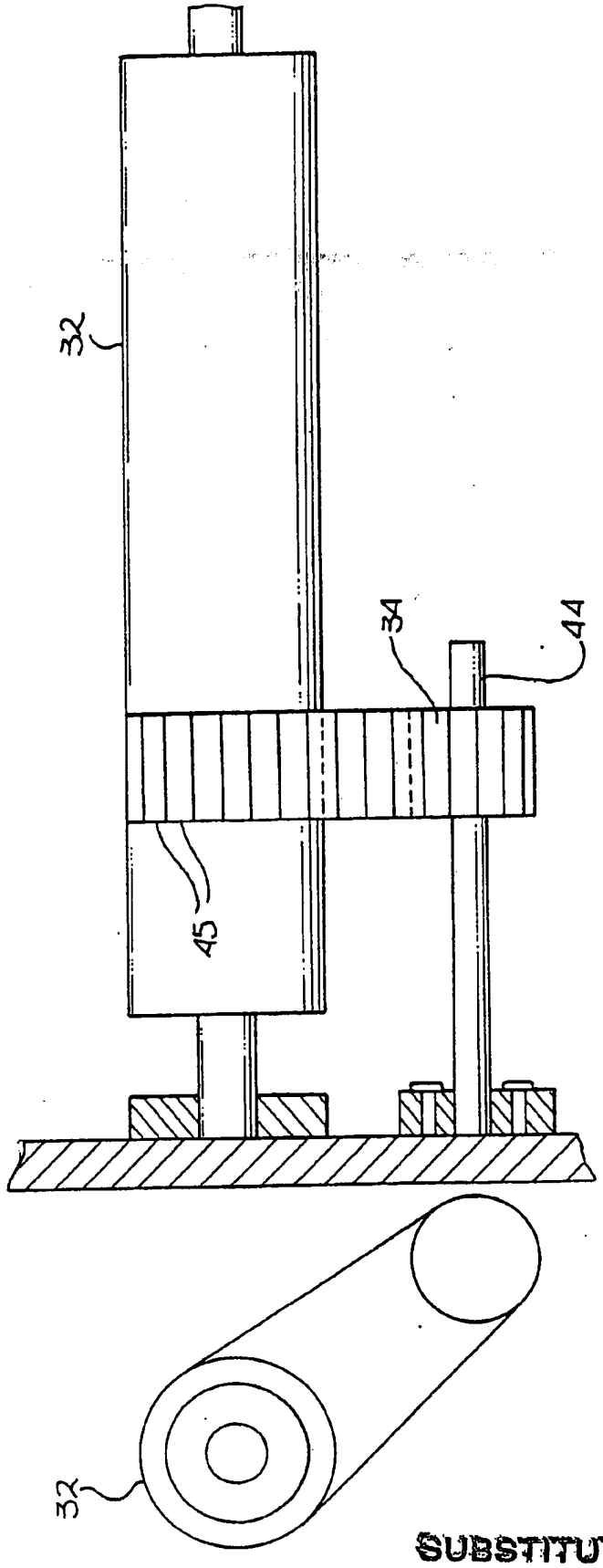

Fig. 11

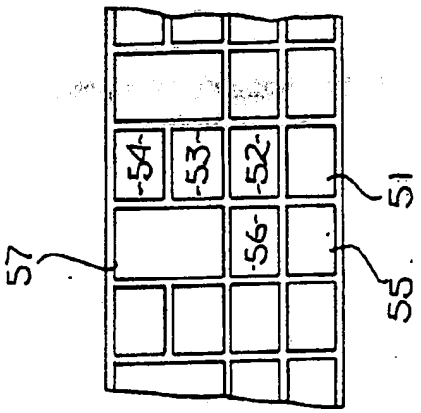

Fig. 12